IN THE CLAIMS:

Please replace the claims of the International application under PCT Article 19 (35 U.S.C. 371(c)(3)with the following:

1. In a mechanical refiner having an inlet for receiving a slurry to be refined, a discharge outlet for refined slurry, a stator mounting a first refining element, and a rotor mounting a second refining element spaced from said first refining element to define a refining gap in communication with said inlet and said discharge outlet, said rotor being supported for rotary movement about an axis and relative to said stator for refining said slurry in said refining gap; the improvement comprising:

three or more actuators coupled to said stator; and

a controller in communication with said three or more actuators for independently operating said three or more actuators to adjust an axial width of said refining gap and to adjust a trim of said first refining element relative to said second refining element.

2. The improvement as recited in claim 1 wherein said mechanical refiner includes a casing defining a refining compartment having an open end and an end plate closing said open end so as to enclose said first and second refining elements in said refining compartment, said end plate mounting said three or more actuators.

3. The improvement as recited in claim 1 wherein said three or more actuators are arranged symmetrically about the axis.

4. The improvement as recited in claim 1 including a transmission connected to said stator for converting rotary power into axial extension, wherein at least one of said three or more actuators has a drive shaft coupled to said transmission for supplying rotary power to said transmission and inducing axial movement of a portion of said stator.

5. The improvement as recited in claim 1 wherein said controller is an electronic controller programmed to independently operate said three or more actuators to adjust the axial width of said refining gap and to adjust the trim of said first refining element relative to said second refining element.

6. A method for refining a slurry using a mechanical refiner having an inlet for receiving a slurry to be refined, a discharge outlet for refined slurry, a stator mounting a first refining element, and a rotor mounting a second refining element spaced from said first refining element to define a refining gap in communication with said inlet and said discharge outlet, said rotor being supported for rotary movement about an axis and relative to said stator for refining said slurry in said refining gap; said method comprising the steps of:

a) comparing local axial widths of the refining gap at three or more positions along the first refining element with one or more reference values;

b) independently moving three or more spaced portions of the stator along the axis to adjust an axial width of the refining gap and to adjust a trim of the first refining element relative to the second refining element;

c) inducing the slurry to flow through the inlet into the refining gap; and

d) rotating the rotor about the axis and relative to the stator to refine the slurry in the refining gap.

7. Apparatus for use in a mechanical refiner comprising:

an end plate;

a stator including a refining element, said refining element defining an axis; and

three or more actuators supported by said end plate and coupled to said stator for controlling an axial position and trim of said refining element.

8. The apparatus as recited in claim 7 wherein said three or more actuators are arranged symmetrically about the axis.

9. The apparatus as recited in claim 7 wherein at least one of said three or more actuators includes a motor selected from the group consisting of an electric motor, a hydraulic motor and a pneumatic motor.

10. The apparatus as recited in claim 7 wherein at least one of said three or more actuators has a ram extending substantially in parallel with the axis.

11. The apparatus as recited in claim 7 wherein at least one of said three or more actuators has a drive shaft extending transversely to the axis.

12. The apparatus as recited in claim 7 including a transmission connected to said stator for converting rotary power into axial extension, wherein at least one of said three or more actuators has a drive shaft coupled to said transmission for supplying rotary power to said transmission and inducing axial movement of a portion of said stator.

13. The apparatus as recited in claim 7 wherein said controller is an electronic controller programmed to independently operate said three or more actuators to adjust the axial width of said refining gap and to adjust the trim of said first refining element.

14. The apparatus as recited in claim 7 including at least three sensors mounted on said stator for generating a plurality of sensor signals, wherein said controller is an electronic controller programmed to compare said plurality of sensor signals with one or more reference values, and to independently operate said three or more actuators to adjust the axial position and trim of said first refining element.

15. The apparatus as recited in claim 14, wherein the signals generated are one of distance, pressure and temperature conditions representing refining gap and processing conditions.

16. The improvement as recited in claim 1, wherein the actuators are further comprised of a ball nut engageable with precision threads in response to an encoded information driven motor.

17. The improvement as recited in claim 16, wherein the controller is an encoder actively adjusting the axial width of said refining gap and said trim according to changing operating conditions.

18. The improvement of claim 17, wherein the operating conditions are at least one of refiner element wear, pressure, temperature and motor revolutions.

19. A method for refining a slurry using a mechanical refiner having an inlet for receiving a slurry to be refined, a discharge outlet for refined slurry, a stator mounting a first refining element, and a rotor mounting a second refining element spaced from said first refining element to define a refining gap in communication with said inlet and said discharge outlet, said rotor being supported for rotary movement about an axis and relative to said stator for refining said slurry in said refining gap; said method comprising the steps of:

a) initializing the refining gap to zero;

b) comparing operating conditions in the mechanical refiner with one or more reference values;

c) independently moving three or more spaced portions of the stator along the axis to adjust an axial width of the refining gap and to adjust a trim of the first refining element relative to the second refining element according to operating conditions;

d) inducing the slurry to flow through the inlet into the refining gap; and

e) rotating the rotor about the axis and relative to the stator to refine the slurry in the refining gap.

20. The method recited in claim 19, wherein the operating conditions are at least one of refiner element wear, pressure, temperature, and motor revolutions.

21. The method recited in claim 19, wherein actuators comprising a ball nut engageable with precision threads move the spaced portions of the stator in response to an encoder information driven motor.